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ABSTRACT

The major aim of this paper is to try to develop a cost analysis system model appropriate to the projects of the Center for Urban Education. Cost analysis can be viewed as an application of the economic concept of system analysis. The analysis always moves from a base that represents the existing capability and resources. The problem is to determine the resources needed to acquire some specified capability. System costs are generally identified and grouped in a model as (1) research and development cost, and (2) installing and operating cost. The model under discussion here was developed to evaluate the Community Learning Center program. Cost analysis was essential to determine the expected costs of the Community Learning Center as well as other projects within the center for a given expected benefit. Cost analysis was also necessary to identify the costs for a potential buyer to use the model. During 1969, CUE operated two Community Learning Centers: one in an impoverished Puerto Rican neighborhood in the South Bronx and the other in a black ghetto in Brooklyn. In each center the following programs were conducted in an experimental basis: Leadership Development Program, Parent Participation Workship, and School-Community Seminars. (Author/JM)

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A SYSTEM FOR COST ANALYSIS *

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A SYSTEM FOR COST ANALYSIS

I. Introduction

A. Statement of the Problem

In approaching educational evaluation for a research and development agency, we need to look at the underlying conceptual base. Conceptualization used here may be divided into two classes: (1) Conceptions of the nature of cost analysis in general; and (2) Conceptions of cost analysis as applied to a specific system such as the Center for Urban Education.

Although other organizations have developed appropriate system models for evaluating effectiveness for a given expected cost, there are few adequate conceptualizations of decision-making processes, and their associated information requirements, in education. Consequently, the major aim of the paper is to try to develop a cost analysis system model appropriate to the projects of the Center for Urban Education.

B. Objective of the Study

The basic objective of the study is to try to answer two major questions:

1. What are the costs under the development process?
2. What are the costs for a potential buyer to use the model?

These principal questions can be divided into several sub-questions:

1. What are the costs under the development process?

   a. By what procedure did CUE establish Community Learning Centers in the Bronx and Brooklyn in 1969-70 and 1970-71, (including the three program components)?

   b. How much did it cost CUE to establish Community Learning Centers in the Bronx and Brooklyn in 1969-70 (including the three program components)?

   c. What is CUE's budget for maintaining the Community Learning Centers in the Bronx and Brooklyn in 1970-71, (including the three program components)?

   d. How many participants are involved in the program, (including the three components)?

   e. How many students has the program affected?

2. What are the costs for a potential buyer to use the model?

a. What are the procedures for adopting Community Learning Centers (including the three program components) in other communities?

b. What are the following costs for adopting Community Learning Centers (including the three program components) in other communities?

(1) pre-adoption costs, (2) facility costs, (3) material costs, (4) training costs and (5) staffing costs?

(i) What are the hypothesized tasks for a potential buyer for:

(1) pre-adopting, (2) facility renting, (3) material purchasing, (4) training period, and (5) staff recruiting?

(ii) What are the hypothesized costs for a potential buyer for (1) pre-adopting, (2) facility renting, (3) material purchasing, (4) training period, and (5) additional staff recruitment?

C. The Nature of the Cost Analysis

Cost analysis can be viewed as an application of the economic concept of system analysis. The analysis always moves from a base that represents the existing capability and resources. The problem is to determine the resources needed to acquire some specified capability. System costs are generally identified and grouped as (1) research and development cost, and (2) installing and operating cost.

(1) Research and Development Cost

This is primarily associated with the development of a new system or capability to the point where it is ready for the introductory marketing stage. This category includes (prototype materials and equipment used in a development program.)

(2) Installing and Operating Cost

This is associated with installing, adopting, operating, supporting and maintaining the system for capability in the other setting. As seen in Figure I, the research and development costs are higher than in the installing and operating stage.

D. Nature of the Program

The Center for Urban Education's main goal is to strengthen (1) professional efforts to educate the young toward literate and socially concerned adulthood, and (2) citizen participation in the shaping of educational affairs. CUE believes that this twofold objective can be achieved only by redesigning the fundamental structure of urban and suburban public education. Furthermore, the Center's research and its evaluation of educational programs have clearly indicated that two of the major defects

FIGURE I

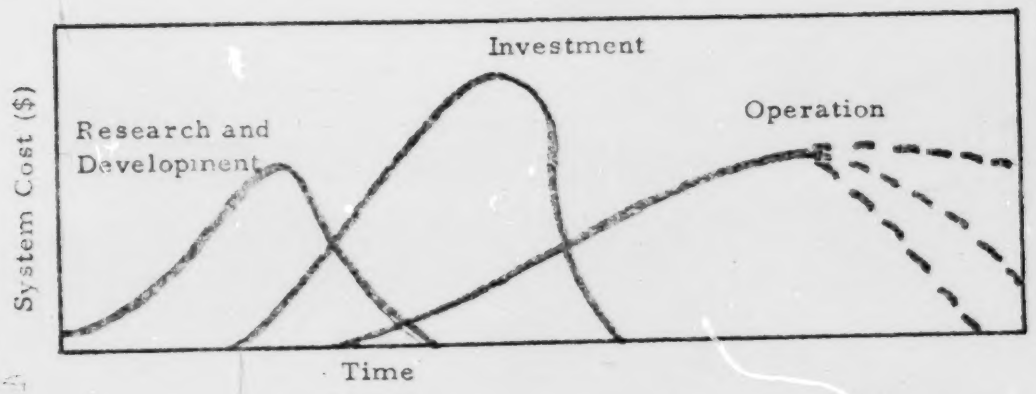

Figure I: Life cycle costs: Illustration of system "Life Cycle" plotted against time. (Adapted from McCullough, p. 18)

in urban educational systems are: (1) lack of communication between formal educational system and inner-city communities and (2) lack of effective community leadership to articulate and communicate community aspirations and needs to the formal educational system. CUE's research also indicated that without outside assistance and pressure, the institutional changes required to meet the urgent outcries of inner-city citizens for full participation in the social order are slow in coming. The needs, clear and documented, become a challenge to the Center. It's response to the problem was the Community Learning Center.

During 1969, CUE operated two Community Learning Centers: one in an impoverished Puerto Rican neighborhood in the South Bronx and the other in a Black ghetto in Brooklyn.

In each Center the following programs were conducted on an experimental basis:

Leadership Development Program -- Three cycles of a fifteen week 135 hour training program trained a total of 175 community residents. The topics were (1) the decentralization law (2) policy functions as defined by the law (3) the budgetary and fiscal process, and (4) proportional respresentation.

About 90 percent of the trainees completed the course and the interest generated in this group has led to the scheduling of a follow-up seminar this year. The training course content proved acceptable and only minor revision was required for this year's program.

Parent Participation Workshop -- In the Spring of 1970, 140 Black and Puerto Rican parents of fourth grade children from nine schools in the South Bronx attended 20 workshop sessions which explained the curricula in the schools, the administration of the schools, and the role of the home in the learning process, and other important topical areas. Preliminary evaluation of the program indicates that whereas these parents had no record of previous involvement in educational affairs, they exhibited interest in all phases of the training program and an ability to understand the concepts presented. The workshops defined parent recruitment procedures, identified interest and needs of participants, clarified the role of the group leader, and produced a body of training procedures and an organizational structure acceptable to participating parents and school personnel.

School-Community Seminars -- This program was field tested in the Spring of 1970 in the South Bronx Center with

52 participants which included local school principals, school teachers, and members of the community school board. Fifteen weekly seminars were held on such topics as:

1. The concept of school decentralization
2. The concept of community involvement
3. The role of the P. T. A.
4. The role of the principal
5. The problem of accountability

The evaluation of these programs indicated a high degree of participation in well directed, candid discussions in all the topic areas. Utilizing this evaluation, CUE will develop a curriculum (including other topics) and a training manual for the future users. Over the long term, cost analysis, however, is essential to identify the alternative that gives the expected costs of the Community Learning Center as well as other projects within the Center for a given expected benefit. Cost analysis is also necessary to identify the costs for a potential buyer to use the model.

E. The Nature of the Model

The model may be defined as a representation of the system under study. This representation may be used to predict the affect of changes in the system on the system's effectiveness.

There are three types of models which could be used in educational evaluation: an iconic model, an analogue model, and a symbolic model. An iconic model pictorially represents what the system looks like, as does a photograph or a school model. An analogue model employs one set of properties to represent a similar set of properties in the system being studied charts are very simple analogies. A symbolic model is one which employs symbols to designate properties of the system under study and communities by means of mathematical equations or a set of such equations. The models presented in this paper are the analogue models.

F. Scope and Limitation

The scope of the present system is limited to the cost measures for static analysis for the Community Learning Center. We understand that several levels of cost analysis are constantly in process where the Community Learning Centers operate. Each requires a different kind of analysis. For the time-phased cost analysis, the typical alternative cost analyses are (1) annual and cumulative funding requirements and (2) present worth of the expenditure stream at a selected discount rate. For the non-time phased, static analysis, the cost analysis include (1) research and development cost and (2) installing and operating cost.

G. Assumption

The following assumptions are important elements of the study: (1) The existence of the planning and programming process of Community Learning Centers. This process incorporates an information system to present data in meaningful categories essential to present study, (2) The existence of a budgeting process which can present the CLC program and financial data for the present study.

II. The Cost Analysis Model for the Community Learning Centers

There are two questions to be answered:

a. What are the costs under the development process by CUE, and

b. What are the costs to the potential buyer?

The analysis model has two divisions:

1. Cost under development process
2. Cost for marketing purposes

(1) Cost Under Development Process

The basic model for this kind of analysis is a matrix form. Along the horizontal axis are the seven types of cost that are involved. Along the vertical axis are the components of the Community Learning Center. This produces the 35 cells each representing the pieces of information needed for making

decisions. Costs, in addition to the components of the Community Learning Center, are as follows:

Direct Cost: In this category, the following items are included: Personal costs (salaries and wages, benefits, consultants, shared time personnel), transportation costs, rent and utilities cost, communication cost, printing and reproduction, other services (equipment rented, data processing, sub-contracts and joint agreements) supplies and equipment.

Indirect Costs: In this category the following items are included: program support costs (planning, and management and support services) and unallocated institution costs.

Total Costs = the combination of the direct cost and its indirect cost.

Number of Participants = the number of participants in leadership program, parent workshop, and school seminar.

Number of Students Affected = the number of students within the school district where the CLC Programs are implemented.

Cost per Participant = the index of the total cost divided by the number of participants.

Cost Per Student = the index of the total cost divided by the number of students affected (See Chart I).

2. Cost for Marketing Purpose

The basic model for this kind of analysis is also a matrix form. Along the horizontal axis are the six types of costs that are included. Along the vertical axis are the components of the Community Learning Center. This produces the 30 cells each representing the pieces of information needed for the potential buyers to make a decision or whether or not to install the model in their locations. The costs are as follows:

Pre-Adoption Costs. This includes the cost incurred before the decision was made to adopt CLC, such as visit to CLC and preparing reports.

Training Costs. Cost of training superintendent principals, assistants and CLC coordinator.

Facility Cost. Cost of CLC site physical rent and the communication cost.

Material Cost. Cost of all materials and equipment purchased especially for CLC.

Staff Costs. Cost of the salaries of any additional personnel hired for the CLC program and the pay for program participants. (Chart II).

Although certain criteria must be met in order to get CLC adopting costs successfully, what will work best in a particular situation depends heavily on the geographical location as the

needs of the people involved. It is hoped that this classification of the adopting cost will prove useful as the guidelines for the potential users who are going to adopt the CLC in the future.

III. Conclusion

The model under discussion was developed for the Center for Urban Education to evaluate the program of the Community Learning Center in 1970-71. Changes in the magnitude and scope of the evaluation job in the Center for Urban Education should be reflected in the model.

CHART I

Costs Analysis for Community Learning Center -- Developing Costs

Center for Urban Education

	Direct Costs	Indirect Costs	Total Costs	No. of Partici-pants	No. of Students Affected	Cost per Partici-pants	Cost per Student Affected
Community Learning Center							
Leadership Training							
Parents Workshop							
School-Community Seminars							
Total							

CHART II

Costs Analysis for Community Learning Center -- Marketing Costs

	Pre-Adoption Costs	Facility Rent Costs	Training Costs	Materials Costs	Staffing Costs	Total Costs
Community Learning Center						
Leadership Training						
Parents Workshop						
School-Community Seminars						
Total						

Appendix

Work Paper Cost for Community Learning Center Program

The Center for U rban Education offers the following guidelines to assist you in determining the cost of the proposed Community Learning Center (CLC) program.

Through this procedure, you are given a valua ,le new tool for comparing the cost and educational worth of your present program with the program for CUE's Community Learning Center.

The steps are arranged sequentially. Your CUE representative will work with you to complete each step in order that all factors may be isolated and included in cost analysis.

Step 1 Define the target population and program

_____ = Name of Educational Program

_____ N1 = Total number of participants in target population

_____ N2 = Total number of schools within the target population

_____ N3 = Total number of students within target population

Step 2 _____ = Pre-adoption cost

This includes the cost incurred before the decision made to adopt CLC and preparing of reports. Please describe the related tasks in the right column and associate costs in the left column.

Cost Item 21 $_____ = Task # 21_____

_____

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Cost Item 22 $_____ = Task # 22_____

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Cost Item 23 $_____ = Task # 23_____

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Cost Item 24 $_____ = Task # 24_____

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Cost Item 25 $_____ = Task # 25_____

_____

_____

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_____

Cost of Step 2 $_____ = Cost Items 21 + 22 + 23 + 24 + 25

(Total costs of Step 2)

Step 3 = Define the Facility Cost

This includes the cost of CLC site rent and utilities. Please describe the related task in the right column and the associated costs in the left column.

Cost Item 31 $_____ = Task # 31_____

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Cost Item 32 $_____ = Task # 32_____

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Cost Item 33 $_____ = Task # 33_____

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Cost Item 34 $_____ = Task # 34_____

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Cost Item 35 $_____ = Task # 35_____

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Cost Item 36 $_____ = Task # 36_____

_____

_____

_____

_____

Cost of Step 3 $_____ = Cost Items 31 + 32 + 33 + 34 + 35 + 36 (Total cost of Step 3)

Step 4 $_____ Define Training Cost

This includes the cost of training Principals, Superintendents, Aids and CLC Co-ordinators. Please describe the related task in the right column and the associated costs in the left column.

Cost Item 41 $_____ = Task # 41_____

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Cost Item 42 $_____ = Task # 42_____

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Cost Item 43 _____ = Task # 43_____

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Cost Item 44 _____ = Task # 44_____

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Cost Item 45 _____ = Task # 45_____

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_____

Cost of Step 4 _____ = Task #4 = 41 + 42 + 43 + 44 + 45
(Total costs of Step 4)

Step 5 = Define the material cost

This includes the cost of all materials and equipment purchased specially for CLC. Please describe the related materials in right column and associated costs in the left column.

Cost Item 51 $_____ = Material # 51_____

_____

_____

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Cost Item 52 $_____ = Material # 52_____

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Cost Item 53 _____ = Material # 53_____

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Cost Item 54 _____ = Material # 54_____

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Cost Item 55 $_____ = Material # 55_____

_____

_____

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_____

Cost of Step 5 $_____ = Total Material Cost = 51 + 52 + 53 + 54 + 55

Step 6 = Define the Staffing Cost

This includes the cost of the salaries of any additional personnel hired for the CLC program and the pay for program participants. Please describe the related personnel in the right column and the associated cost in the left column.

Cost Item # 61 $_____ = Personnel # 61_____

_____

_____

_____

_____

Cost Item # 62 $_____ = Personnel # 62_____

_____

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_____

_____

Cost Item # 63 $_____ = Personnel # 63_____

_____

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_____

Cost Item # 64 $_____ = Personnel # 64_____

_____

_____

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_____

Cost Item # 65 $_____ = Personnel # 65_____

_____

_____

_____

_____

Cost of Step 6 $_____ = Total costs of staffing = +61 +62 +63 + 64 + 65

Cost of CLC (A)$_____ = Cost steps 2 + 3 + 4 + 5 + 6

Cost per participant $_____ = Cost of CLC (A) ÷ total number of participants in target population (N1)

Cost per student $_____ = Cost of CLC (A) ÷ total number of students in target population (N3)

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